

In the drawings:

The drawings have been amended to correct the informalities and the clerical errors as indicated in the office action.

Please substitute the current drawings with a new set of formal drawings incorporating the marked changes.

REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested. Claims 1, 3, 6, and 8 have been amended. The amendment is fully supported by the original specification. Claims 1-11 remain pending. In addition, drawings have been amended to correct the informalities and the clerical errors as indicated in the office action. The specification has also been amended based on the text captions in the original drawings. No new matter is added.

Claims 1-11 stand rejected under either 35 USC 102(b) over Chen or under 35 USC 103(a) over Chen in view of Choi '469. Such rejections, however, have been overcome by the above amendment.

Claims 1-11 as amended above now recite each of the quantum-well structures arranged in columnar shapes to have "opposing parallel side walls perpendicular to said substrate." This feature is illustrated in FIG. 1 of the original specification. In contrast, Chen's devices rely on slanted surfaces as shown in FIGS. 1(b), 1(c), and 2 to redirect input light. Hence, Chen fails to disclose this feature of Claims 1-11.

Similar to Chen, Choi '469 fails to teach this feature of Claims 1-11. Different from Chen, Choi '469 uses a transparent substrate 21 with an angled side surface 22 to receive input light in order to cause optical absorption in the quantum-well layers 24.

Therefore, both Chen and Choi '469, either individually or collectively, fail to disclose each feature of Claims 1-11. For this reason alone, Claims 1-11 are patentable over Chen and over Chen in view of Choi '469.

Notably, the devices in Claims 1-11 do not need any slanted surface in the quantum-well structures or the substrate to produce light that propagates along the quantum well layers for absorption. To the contrary, Claims 1-11 recite each quantum well structure to have opposing parallel side walls perpendicular to said substrate. Hence, light with normal incidence is parallel to the side walls and cannot be reflected to a direction that has a component parallel to the quantum well layers for absorption.

To redirect light at normal incidence to the substrate, devices in Claims 1-11 use quantum-well structures arranged in columnar shapes and spatially separated from one another to form a periodic array to optically diffract light. In addition, Claims 1-11 further recite that opposing parallel side walls

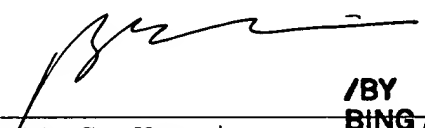
perpendicular to said substrate in each quantum-well structure forms "an optical cavity therebetween." This optical cavity can reflect diffracted light between the opposing surfaces multiple times to increase the effective interaction length and thus the efficiency of absorption. See, e.g., the original specification at pages 5-6.

Clearly, the structures, operations, and performance of the devices recited in Claims 1-11 are entirely different from Chen and Choi '469. It is respectfully suggested that Claims 1-11 are patentable and should be allowed.

Applicants respectfully suggest that all outstanding issues are resolved and that all claims are in condition for allowance. An official notice of allowance is hereby respectfully requested. Please charge the \$55 one month extension of time fee, and any other applicable charges or credits, to Deposit Account No. 06-1050.


Respectfully submitted,

Date: April 30, 2003



Scott C. Harris
Reg. No. 32,030

/BY
BING AI
REG. NO. 43,312

Fish & Richardson P.C.
PTO Customer No. 20985 
4350 La Jolla Village Drive, Suite 500
San Diego, California 92122
Telephone: (858) 678-5070
Facsimile: (858) 678-5099

10265754.doc